## Re: Letter to the Editor – Comment on: 'sufficient levels of 25-hydroxyvitamin D and protein intake required to increase muscle mass in sarcopenic older adults – The PROVIDE study'

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Letter to the Editor

# Re: Letter to the Editor — Comment on: 'Sufficient levels of 25-hydroxyvitamin D and protein intake required to increase muscle mass in sarcopenic older adults — The PROVIDE study'

We thank Dr Oliver for the letter to the editor regarding our PROVIDE post-hoc analysis published in Clinical Nutrition. Dr Oliver emphasized the relevance of the timing of dietary intake, in particular protein and vitamin D intake. An adequate intake of dietary protein, combined with physical exercise, is required to ensure sufficient postprandial muscle protein synthesis, and thereby maintaining and potentially increasing muscle mass [1]. Nutritional strategies to overcome the anabolic resistance in older adults have focused on providing an adequate amount of high-quality protein distributed over the meals throughout the day. Each meal should ensure the provision of 25–30 g protein per meal, with minimally 10–15 g readily available essential amino acids and about 3 g leucine to stimulate muscle protein synthesis in older adults [2]. For a maximal stimulation of muscle protein synthesis in older adults, even higher dosages up to 40 g of high-quality protein have been proposed recently [3] or ~0.40 g/kg body weight evenly distributed over breakfast, lunch, dinner [4].

In older adults, the amount of protein traditionally ingested at breakfast is between 5 and 10 g protein and also the protein intake during lunch is often insufficient [5]. These time frames were therefore used as targets in the PROVIDE study to increase the total muscle protein synthesis throughout the day. The participants of the PROVIDE trial were instructed to consume the vitamin D and leucine-enriched whey protein drinks twice daily throughout the 13-week intervention period [6]. According to protocol one serving of the product had to be taken in the morning, just before breakfast, and the second one just before lunch. This regime should ensure an adequate bolus of protein in addition to the meals. Furthermore, vitamin D has been absorbed well, possibly facilitated by the fat present in the study products and meals, and led to adequate increases in serum 25-hydroxyvitamin D levels.

Additional protein ingestion before bed time is another interesting approach to maximize the anabolic response in older adults that may support muscle preservation in aging and disease [3]. Moreover, appropriate timing of protein ingestion around physical activity, especially resistance exercise, has a positive and synergistic effect on skeletal muscle protein [7]. Even though protein synthesis in the first hour after exercise is maximized, the sensitivity of the muscle to protein feeding is enhanced for up to 24 h after exercise. As such, increasing the availability of essential amino acids during this period results in a maximum benefit of this improved anabolic window.

Overall, we agree with Dr Oliver that the timing of dietary protein intake during the day needs attention to maximize the anabolic effect in addition to ensuring an adequate quantity and quality of the protein intake, preferably in combination with physical exercise.

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